

Vivekanand College, Kolhapur (Empowered Autonomous)
Department of Electronics
Assignment notice
(B.Sc-I)

Date: 15/10/2025

Course/Subject Name: 2DSC03ELE11

All the students hereby informed that, submit the assignment of Analog Electronics-I on or before 25/10/2025 as per the given question paper

Date: 25/10/2025


Mr. G. B. Jirage
Subject Teacher




Dr. C. B. Patil
Head of the Department
HEAD
DEPARTMENT OF ELECTRONICS
VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS)

VIVEKANAND COLLEGE, KOLHAPUR
(AN EMPOWERED AUTONOMOUS INSTITUTE)

Class: B.Sc.-I, Semester-I,

Course code: 2DSC03ELE11

Subject: Analog Electronics- I

Date:-15/10/2025 Time: 03:00 to 03:30

Marks: 10

Q.1.Select the Correct alternative

[2M]

- i. Preset is theresistor.
a) film b) fixed c) variable d) none of these
- ii. Electrically operated switch is
a) transformer b) relay c) fuse d) inductor

Q.2 .Attempt any Two (Four mark each)

[8 M]

- i. Explain different types of inductors..
- ii. Give classification of resistors and explain carbon composition of resistor.
- iii. Explain construction and working of electromagnetic relay.
- iv. Write a note on Capacitor.



VIVEKANAND COLLEGE, KOLHAPUR

(An Empowered Autonomous Institute)

B.Sc. Part I Semester-I Electronics Assignment

Course code: 2DSC03ELE11 Course Name: Analog Electronics-I

Sr. No.	Roll No.	Name of the Students	Sign	Marks
1	7233	ANGANE DIVYA SHAMRAV	—	AB
2	7234	BAGWAN HEENA HANJALA	Bayawan	06
3	7235	BODAKE SANIKA SATISH	—	AB
4	7236	CHANDANSHIVE SIDDHARTH SANTOSH	—	AB
5	7237	DARAGADE SRUSHTI SURESH	Sdaragade	07
6	7238	GAIKWAD SHIVTEJ SACHIN	—	AB
7	7240	GAVADE DIPAK BIKAJI	Gavade	06
8	7241	GURAV ONKAR MAHESH	—	AB
9	7244	JAHDAV PARTH PRAKASH	—	AB
10	7245	JARALI ABHAY SHANKAR	—	AB
11	7246	KAMBLE HARSHAD GANPATI	Kamblon	10
12	7247	KHARAPE ARJUN BAJARANG	—	AB
13	7249	LAGARE AKASH ANANDA	—	AB
14	7250	LOHAR SUSHANT SUBHASH	—	AB
15	7251	MALI VIJAY HANAMANT	—	AB
16	7252	MIRJE KAIVALYA ABHINANDAN	Kmirje	10
17	7253	MULANI TAHIRHUSSAIN RAJU	—	AB
18	7254	PAGARE SARTHAK SANJAY	—	AB
19	7255	PANDIT ADITYA MAHADEV	Pandit	10
20	7256	PATIL PRATHMESH SATISH	Patil	07



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Sr. No.	Roll No.	Name of the Students	Sign	Marks
1	7283	ANGAJ OM LAHU	—	AB
2	7284	BAVADEKAR ARYAN ANANDA	—	AB
3	7285	BHALEKAR JANHAVI SANDEEP	<u>Bhalekar</u>	10
4	7286	BIRANJE SUYASH UDAY	<u>U Biranje</u>	06
5	7287	DEMANNA PIYUSH SURESH	—	AB
6	7288	GHADAGE ATHARV RAJESH	<u>Ghadye</u>	06
7	7289	JADHAV PARAS RAMDAS	—	AB
8	7290	MANE SHREYASH YUVRAJ	—	AB
9	7291	MANE TUSHAR SANTOSH	—	AB
10	7292	MOMIN MAHAMMADANAS ASHPAK	—	AB
11	7293	PATIL ANIKET NAMDEV	—	AB
12	7294	PRABHU OM YASHWANT	<u>Prabu</u>	07
13	7296	AGALE SAMRUDDHI HINDURAV	—	AB
14	7297	AWATE SARVASVI SWAPNIL	<u>Swate</u>	AB
15	7298	BEDAGE SAMRUDDHI SANJAY	—	10
16	7299	DESHINGE VASUNDHARA MARUTI	<u>V. Deshinge</u>	08
17	7300	HAJGULKAR SALONI SURESH	—	AB
18	7301	HEBBALI RITISHA SANTOSH	—	AB
19	7302	JADHAV SANJANA ASHWIN	—	AB
20	7303	KALANTRE PRANALI SARJERAO	—	AB

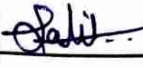
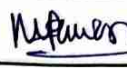


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Sr. No.	Roll No.	Name of the Students	Sign	Marks
1	7257	PATIL VIGHNESH NARAYAN		06
2	7258	PATIL SAHIL DAGADU	—	AB
3	7259	POWAR MANDAR PRATAP		10
4	7260	RAUT ANIKET SATISH	—	AB
5	7261	SHAH NAMIT RAJENDRA		08
6	7263	TEVARE ADITI SADASHIV	—	AB
7	7264	PATIL ADITI SAHEBRAO		08
8	7566	JADHAV SHUBHAM RAJENDRA	—	AB
9	7571	PATIL KEDAR BABASO	—	AB
10	7573	PATIL ATHARV DATTATRAYA	—	AB
11	7579	KADAM PAWAN BAJIRAV	—	AB
12	7583	NIGADE PARTH MANOHAR	—	AB
13	7593	SAVANT PIYUSH PUNDALIK	—	AB
14	7595	NIGADE HARSHVARDHAN RAVIRAJ	—	AB
15	7606	MALAI SHREYA SHANKAR		08
16	7304	PATIL MANALI DEVAPPA	—	AB
17	7305	PATIL SANSKRUTI DHIRAJ		10
18	7307	SATALE PRAGATI UTTAM		07
19	7308	TAMBOLI MARIYA RIYAJ		04
20	7309	WADKAR NIKITA VISHWAS	—	AB
21	7310	WARKARI SRUSHTI DAGADU	—	AB
22	7568	SARGAR SANIKA RAMCHANDRA	—	AB
23	7588	MUSHRIF ALFIYA KAMAAL	—	AB



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B.Sc. Part I Semester-I Electronics Assignment

Course code: 2DSC03ELE11 Course Name: Analog Electronics-I

Sr. No.	Roll No.	Name of the Students	Sign	Marks
1	7268	PATIL KSHITIJ RAVINDRA	<u>K.Patil</u>	07
2	7311	BARGE ABHILASHA BAJIRAO	<u>A.B.Barge</u>	09
3	7314	BHOSALE NAMRATA NANDKUMAR	<u>N.Bhosale</u>	06
4	7315	DAVARI SURAJ EKNATH	<u>S.Davari</u>	09
5	7316	GAVALI JANHAVI TANAJI	<u>J.T.Gavali</u>	09
6	7317	JAMDAR JYOTIRAJ INDRAJIT	<u>J.Damdar</u>	05
7	7318	KORANE SHRAVANI SAKHARAM	<u>S.Korane</u>	09
8	7319	MACHALE VIRAJ SANGRAM	—	
9	7320	PATEL RUHI HARESH	<u>R.Patel</u>	08
10	7321	PATIL NAKSHATRA SAMADHAN	<u>N.Patil</u>	07
11	7322	PATIL PRASANNA HARISHCHANDRA	—	
12	7323	PATIL SHREYASH MARUTI	<u>S.M.P.</u>	06
13	7324	PATIL VEDIKA DEEPAK	<u>V.Patil</u>	10
14	7325	PEDNEKAR ASMITA BABURAO	<u>A.Pednekar</u>	08
15	7326	TAMHANEKAR ARPITA DHANAJI	<u>A.Tamhane</u>	04
16	7327	TIKUDAVE SIDDHI NILESH	<u>S.Tikudave</u>	10
17	7497	PATIL AYUSH ASHOK	—	
18	7562	PATIL KETKI AMIT	<u>K.Patil</u>	09
19	7569	Gujar Vedika Phemrajji	<u>Vedika</u>	08
20	7818	Aasya Santosh Bhingarde	<u>A.Bhingarde</u>	08
21				
22				



HEAD
DEPARTMENT OF ELECTRONICS
VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS)

10
10 On

Q1 Select the correct alternative

i] Present is the variable resistor.

→ (C) variable

ii] Electrically operated switch is realy

→ (b) realy

Q2 Attempt any two four (Four Mark Each)

i] Explain different types of inductors.

→

i] Air-Core Inductor: Ceramic core inductors are referred as "Air-core inductors". Ceramic is the most commonly used material for inductor cores since ceramic has no magnetic properties, there is no increase in the permeability value due to the core material. these inductors have less inductance value. these are used in high frequency application including TV and radio receivers.


 Fig :- Symbol of Air-Core inductor

Iron-Core Inductor: these inductors use ferro magnetic material as a core material such as iron. the inductance due to their high magnetic permeability. Permeability measures the ability of supporting the

Pran 

Formation of Magnetic fields within the materials the inductors suffer from core losses and energy losses and energy losses at high frequencies.



Fig:- Symbol of Iron - core Inductor

3. Ferrite Core Inductor:- Ferrite is one of the most widely used cores for different as ferro magnetic material they exhibit magnetic properties due to their higher magnetic permeability these have higher magnetic permeability these have high inductance properly these are high power inductors but limited in higher frequency capacity due to the hysteresis and eddy current losses.

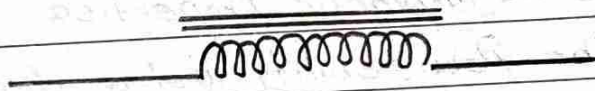


Fig:- Symbol of Ferrite - core Inductors.

2. Give classification of resistors and explain Carbon Composition of resistor.

→ A resistor is a passive component in a circuit which provides resistance to the flow of current. Resistance is the capacity of a resistor to prevent the flow of current or the flow of electric charge within a circuit. Resistance is measured in ohm. Greek Symbol (Ω , omega) with prefixes. is used to denote kilo.ohms ($k\Omega = 10^3 \Omega$) and Mega.ohm ($M\Omega = 10^6 \Omega$). An ohm is the resistance that when a current of one ampere passes through a resistor with a one volt drop across its terminals.

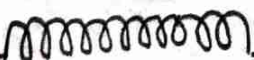


Fig:- Resistor Symbol.

Carbon Composition Resistor :- Carbon Composition resistor is made from the mixture of carbon or graphite powder and a non-conducting ceramic powder to bind it all together. The ratio of carbon dust of ceramic determine the overall resistance value of the mixture of the and the higher the ratio of carbon, the lower the overall resistance. The mixture is moulded into a attached to each end to provide the electrical connection as shown before being coated with an outer insulating material and colour coded markings to denote its resistive value.

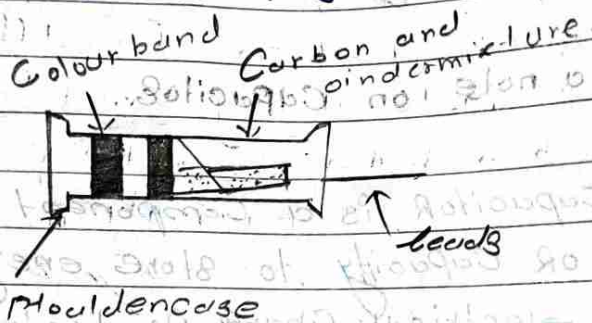


Fig :- Structure of Carbon - Composition Resistor

3. Explain Construction and working of electromagnet Relay

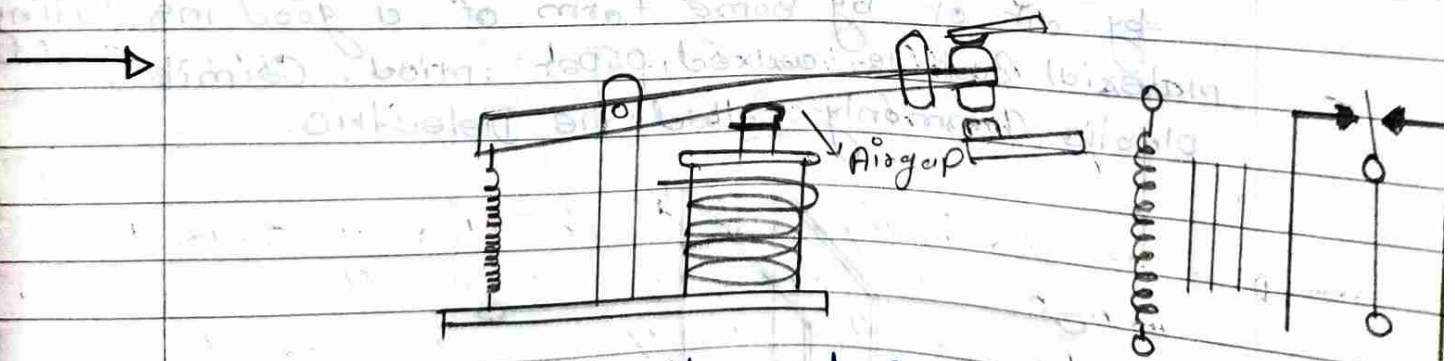


Fig :- Construction and Symbol of Electromagnetic Relay

Working :- The electromagnetic relay consists of various parts such as movable armature, fixed contacts, spring, electromagnet (coil) as shown in Fig to

form electromagnetic mechanically relay. If there is no supply given to the coil terminals, then the relay remains in the off condition as shown in fig. If the relay coil is energized by giving supply to the coil terminals, then the movable contact of the relay is attracted towards the fixed contact thus, the relay turns on. There are energized by electrical supply and perform a mechanical action (on or off) to make or break a circuit are called electro mechanical relays.

④ write a note on Capacitor.

→ The capacitor is a component which has the ability or capacity to store energy in the form of an electrical charge producing a potential difference across its plates. In its basic form, a capacitor consists of two or more parallel conductive (metal) plates which are electrically separated either by air or by some form of a good insulating material such as waxed paper, mica, ceramic, plastic commonly called the Dielectric.

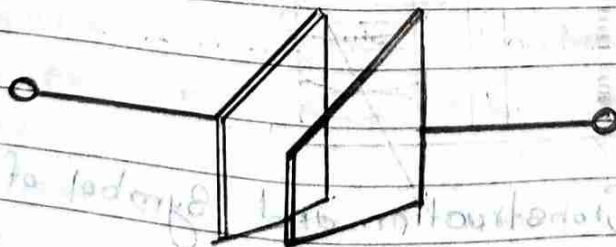
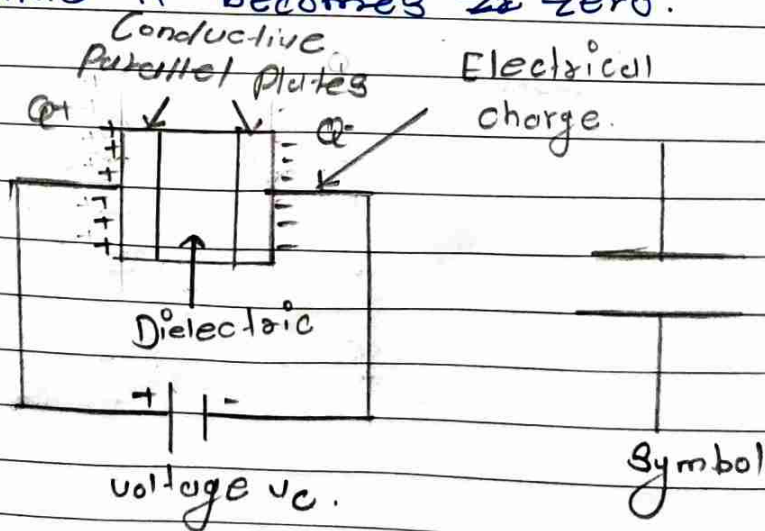


Fig. 1.9.

where, $C = \frac{\epsilon A}{d}$

where, C = Capacitance of a capacitor.
 ϵ = Permittivity of dielectric medium.
 d = Distance between the plates.
 A = Area of the two conducting plates.

When a DC voltage is applied across a capacitor, the positive (+ve) charge quickly accumulates on one plate while a corresponding negative (-ve) charge quickly accumulates on the other plate. The flow of electrons onto the plates is known as the capacitor's charging current which continues to flow until the voltage across both plates is equal to the applied voltage. At this point the capacitor is said to be "fully charged". Likewise, as the current flows out of the capacitor, discharging it, potential difference between the two plates decreases and after some time it becomes zero.



(4)
 enter

The amount of potential difference present across the capacitor depends upon how much charge was deposited onto the plates by the work being done by the source voltage and also by how much capacitance the capacitor has and this is illustrated below.

$$C = \frac{Q}{V}$$

Capacitance is a measure of amount of charge which can be stored within a capacitor. The SI unit of capacitance is the farad (F).

Analog Electronics - I



Q.1 Select the Correct alternative.

i) Preset is the variable resistor.

ii) Electrically operated switch is relay.

Q.2 Attempt any Two. (Four mark each)

i) Explain different types of inductors.

→ An inductor is a passive electronic component which is capable of storing electrical energy in the form of magnetic energy.

• Types of Inductors:

i) Air-core Inductor:

Ceramic core inductors are referred as "Air-core inductors". Ceramic is the most commonly used material for inductor cores. Since ceramic has no magnetic properties, there is no increase in the permeability value due to the core material. These inductors have less inductance value. These are used in high frequency applications including TV and radio receivers.



Symbol of Air-core Inductor.

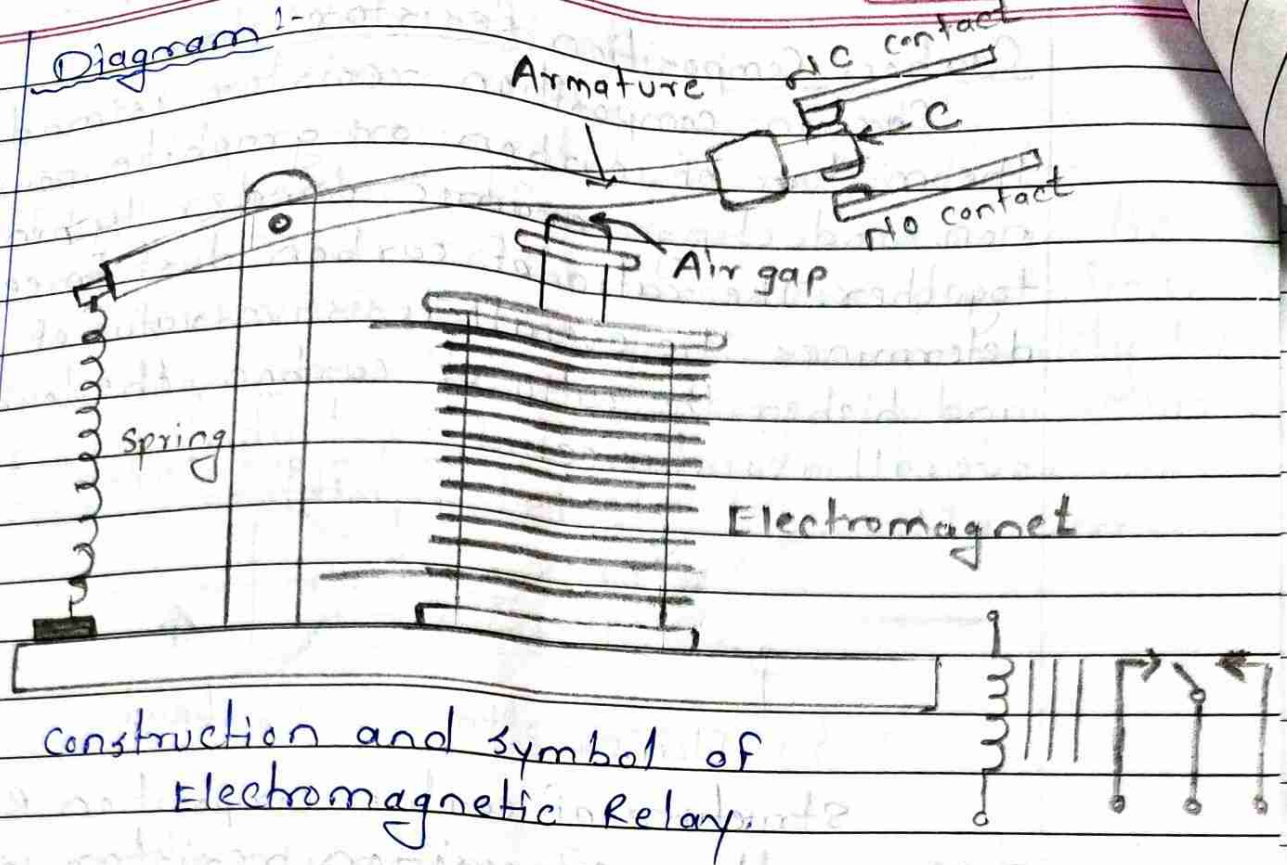
ii) Iron-core Inductor:

These inductors use ferromagnetic materials as a core material such as iron. The usage of such core material helps in increase of inductance, due to their high magnetic permeability. Permeability measures the ability of supporting the formation of magnetic fields within the materials.



Symbol of iron-core inductor.

Diagram 1:-



Construction and Symbol of Electromagnetic Relay.

Working:-

The electromechanical relay consists of various parts such as movable armature, fixed contacts, spring, electromagnet (coil), as shown in Fig. to form electromechanical relay. If there is no supply given to the coil terminals, then the relay remains in OFF condition as shown in Fig. If relay coil is energized by giving supply to the coil terminals, then the movable contact of relay is attracted towards the fixed contact. Thus, the relay turns ON.

Q. Write a note on Capacitor.

The capacitor is a component which has the ability or "capacity" to store energy in the form of an electrical charge producing a potential difference across its plates.

In its basic form, a capacitor consists of two or more parallel conductive plates which are electrically separated either by air or by some form of good insulating material such

iii) Ferrite Core inductors:-

Ferrite is one of the most widely used cores for different types of inductor. Ferrite is also referred as ferromagnetic material. They exhibit magnetic properties due to their higher magnetic permeability & have high inductance property. These are high power inductors but limited in higher frequency capacity due to hysteresis and eddy current losses.


Symbol of Ferrite-core inductor.

ii) Give classification of resistors and explain carbon composition of resistor.

→ A resistor is a passive component in a circuit which provides resistance to the flow of current. Resistance is a capacity of resist to prevent the flow of current or the flow of electric charge within a circuit.

• Resistors can be classified into two groups:-

1) Fixed Resistors:-

A] Linear Resistors:-

- Carbon Composition Resistor.
- Film Resistor
- Wire-wound Resistor.

B] Non-linear Resistors:-

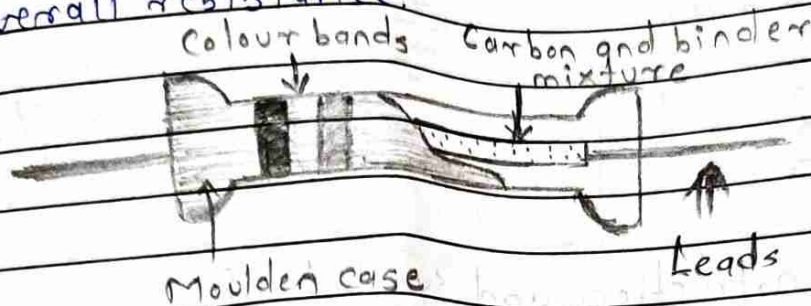
- Thermistor (Temp. Dependent Resistor)
- LDR (Light Dependent Resistor)
- Varistor (Voltage Dependent Resistor).

2) Variable Resistors:-

- Potentiometer (Pot)
- Rheostat
- Preset

Carbon Composition Resistor:

Carbon composition resistor is made from the mixture of carbon or graphite powder and non-conducting ceramic powder and bind it all together. The ratio of carbon dust to ceramic determines the overall resistive value of mixture and higher the ratio of carbon, the lower the overall resistance.



Structure of carbon composition Resistor.

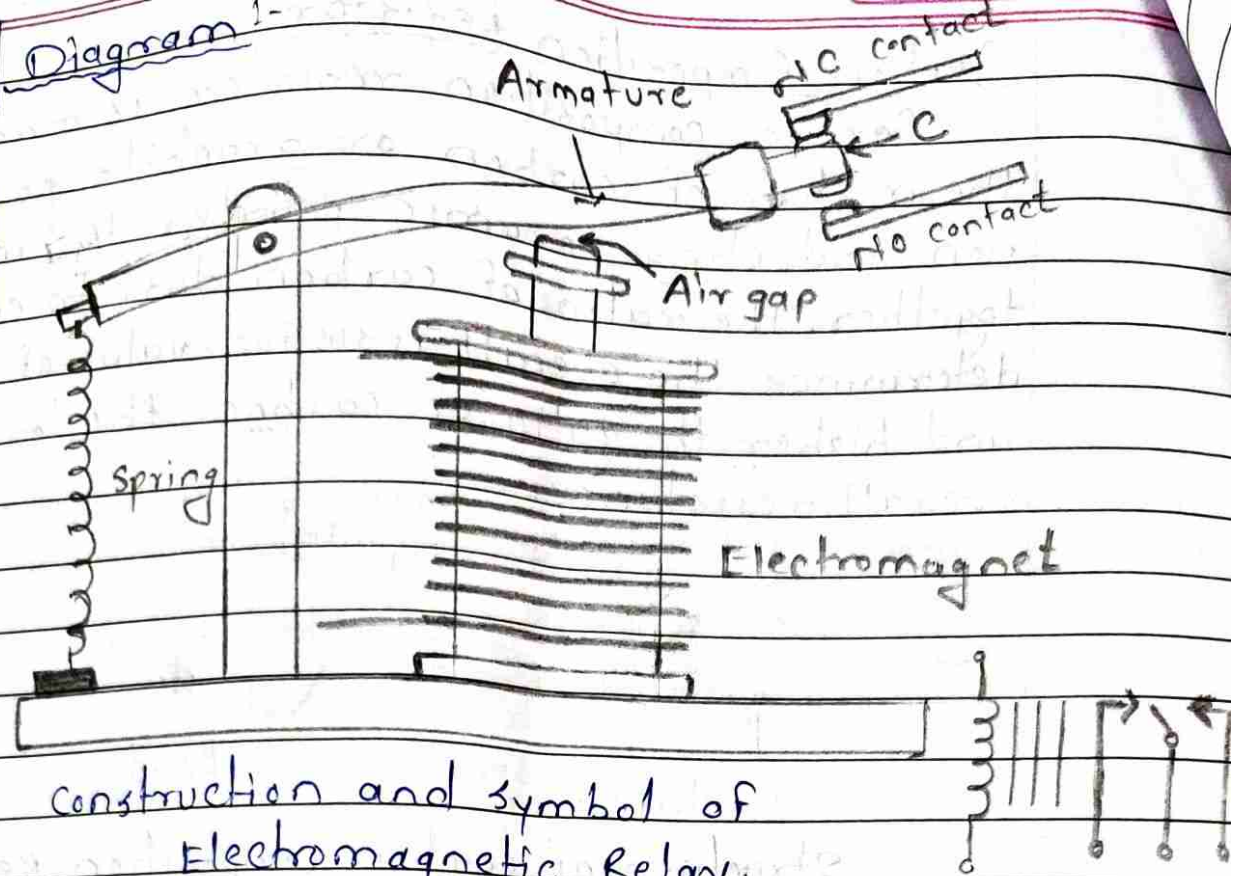
The carbon composition resistor is a low to medium type power resistor. Carbon composition resistors are with power ratings from $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1 and 2 watts and typical tolerance range $\pm 5\%$, $\pm 10\%$, $\pm 20\%$. These resistors are available in resistance range of 1Ω to $\sim 22M\Omega$.

iii) Explain construction and working of electromagnetic relay.

→ Construction:-

An electromagnetic relay is an electronic switch operated by a magnetic coil. The relay switch consist of solenoid that has fixed iron core and armature which is movable. When the coil is energized, the armature is pulled against the stator, closing the magnetic circuit and mechanically closing (or opening) one or more sets of contacts. A spring is often used to provide the force to hold the armature away from fixed portion when solenoid is de-energized.

Diagram 1:-



Construction and symbol of
Electromagnetic Relay.

Working:-

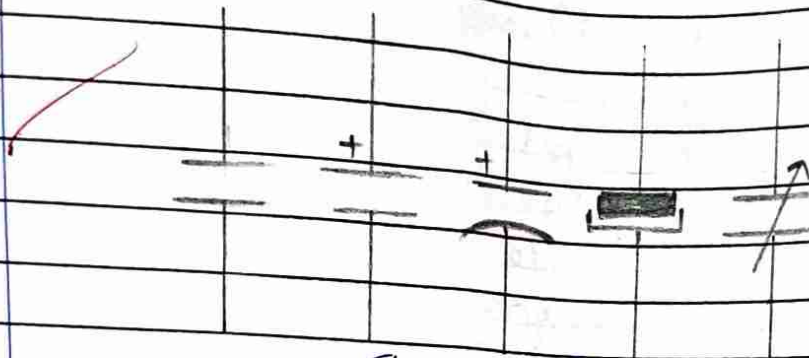
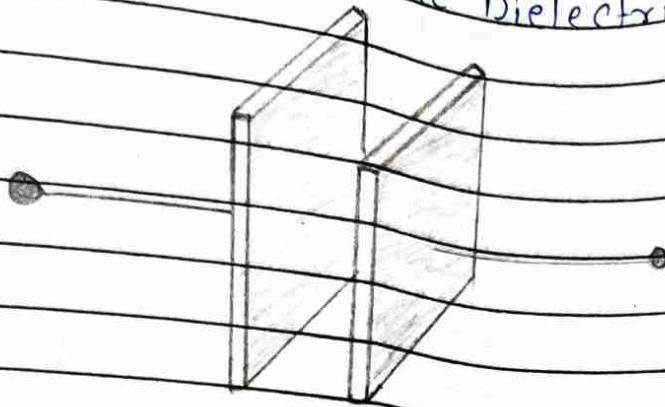
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In its basic form, a capacitor consists of two or more parallel conductive plates which are electrically separated either by air or by some form of good insulating material such

as waxed paper, mica, ceramic, plastic
commonly called the Dielectric.



Symbols of capacitors

$$C = \epsilon A / d$$

where, C = Capacitance of capacitor

ϵ = Permittivity of dielectric medium

d = Distance between the plates

A = Area of two conducting plates.

9/10 Am

Name:- Abhilasha Bajirao Borage

Roll no:- 7311

Q.1] Select the correct alternative.

1] Preset is the --- resistor.
 → c] variable

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 → b] relay

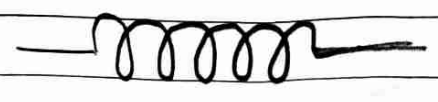
Q.2]

1] Explain

→ Types of inductors:- There are many types of inductors according to the core material used

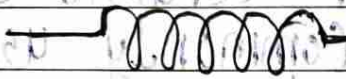
1] Air-core inductor:- Ceramic core inductors are referred as "Air-core inductors". Ceramic is the most commonly used material for inductor cores since ceramic has not magnetic properties. There is no increase in the permeability value to the core material these inductors have less inductance value. These are in high frequency applications including TV and radio receivers.

• Symbol of Air-core inductor:-



2] Iron - Core Inductor : — These inductors use ferromagnetic materials as a core material such as iron. The usage of such core material helps in the increase of inductance, due to their high magnetic permeability. Permeability measures the ability of supporting the formation of magnetic fields within the materials. The inductors suffer from core losses and energy losses at high frequencies.

• Symbol Iron - core Inductor :



3] Ferrite - Core Inductor : — Ferrite is one of the most widely used cores for different types of inductor. Ferrite is also referred as ferromagnetic material. They exhibit magnetic properties. Due to their higher magnetic permeability, these have high inductance property. These are high power inductors but limited in higher frequency capacity.

do to the hysteresis and eddy current losses.

• Symbol of Ferrite - core Inductor :



2] Give Classification of resistors and explain Carbon Composition of resistor.

→ Resistors can be classified into two groups.

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A] Linear Resistors :

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- Wire-wound Resistor

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- Thermistor
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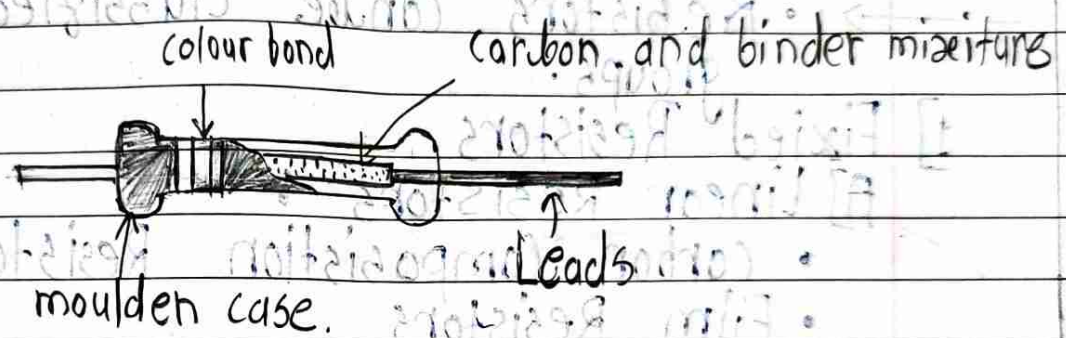
2] Variable Resistor :

- Potentiometer (Pot)
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* Explanation of Carbon Composition Resistor :

'Carbon composition resistor is made from the mixture of carbon or graphite powder and a non-conducting ceramic powder to bind it all together. The ratio of Carbon

dust to ceramic determines the overall resistive value of the mixture and the higher the ratio of carbon the lower the overall resistance. The mixture is molded into a cylindrical shape with metal wires or leads are attached to each end to provide the electrical connection as shown, before being coated with an outer insulating material and colour coded markings to denote its resistive value.



Structure of carbon composition Resistor.

3